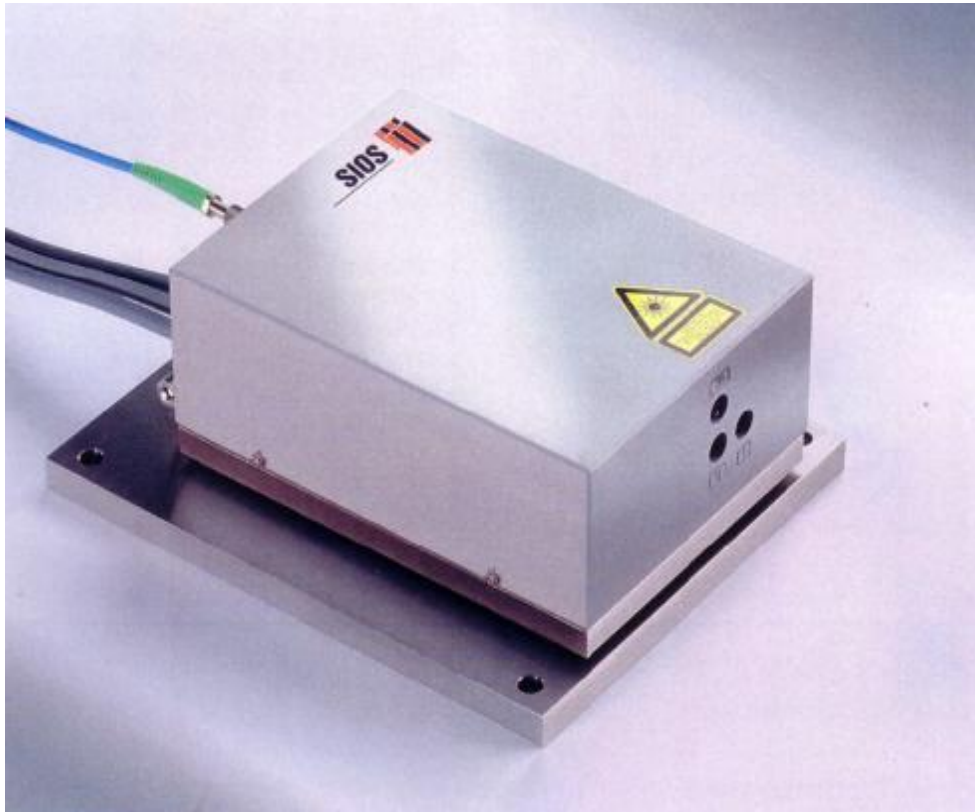


SP-TR Series

Triple-beam Plane mirror interferometer



The SP-TR triple beam interferometer system combines three interferometers into a single unit allowing simultaneous nanometer-precision triaxial length measurements to be performed. Angles can be determined to high precision from the difference between pairs of length measurements and the respective beam separation. The dynamic range for pitch and roll measurements are approximately two minutes of arc.

A single HeNe laser emitting an ultrastable wavelength supplies all three interferometers so that all three length measurements are based on the same reference length. A single fibreoptic cable transmits the laser output to the separate interferometric sensor head. The motions of the moving mirrors are converted into modulated signals that are transmitted to the electronic power-supply/signal-processing unit.

The HeNe laser, which is frequency stabilised in cases where large displacements are to be measured includes sensors for the measurement of barometric pressure and ambient temperature, and is the basis for high metric precision. The operation of the electronic power-supply/signal-processing unit and the display of the measured data utilises a PC running an associated software package.

Applications:

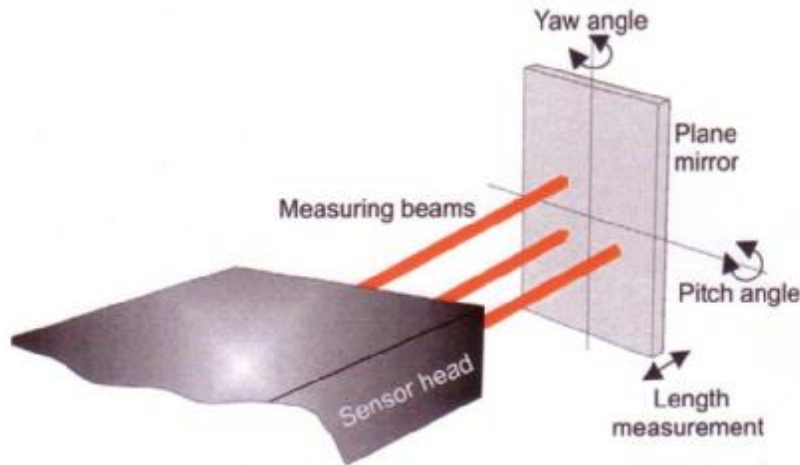
- Laser-interferometric measurements on guides and translation, microscope and positioning stages
- High precision pitch and roll corrections during biaxial or multiaxial length measurements
- Calibrating metrological equipment and machine tools
- Differential measurements (dilatometry, material testing etc)
- Angular measurements over extended ranges ($>\pm 2$ arcmin available)

Performance features

Simultaneous, precise

- triaxial length measurements *OR*
- biaxial length measurements plus a single angle measurement *OR*
- uniaxial length measurement plus a pair of angle measurements

Operating principle



Technical Data

	SP 2000-TR	SP 120-TR
Length measurement range, each axis	2000 mm	100 mm
Length resolution	1 nm	1 nm
Optional length resolution	0.1 nm	0.1 nm
Pitch & roll measurement range	±2 arcmin	±2 arcmin
Horizontal/vertical beam separation	12 mm	12 mm
Angular resolution at 1nm length resolution	0.02 arcsec	0.02 arcsec
Laser wavelength	632.8 nm	632.8 nm
Laser frequency stability (post warm-up)	2×10^{-8}	3×10^{-7}
Laser warm-up period	10...20 min	1 min
Maximum moving-mirror translation rate	800 mm/s	800 mm/s
Operating temperature range	15...30°C	15...30°C
Interfaces	RS232C/USB	RS232C/USB
Laser safety class (DIN EN 60825-1)	2M	2M
Sensor head-to-electronics cable length	3m (10m option)	3m (10m option)
Electrical supply (voltage/frequency VAC/Hz)	100-240/47-60	100-240/47-60

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